

III- 04.01 Common Excavation

It is the intent to try to get all the common excavation from within the right of way. When all the useable material has been utilized, provisions for additional borrow are required.

III- 04.02 Borrow

Borrow is needed when there is insufficient dirt on the project from common excavation to build the roadway template. When borrow is required, the quantity of borrow and where on the project it is needed should be given to the Right-Of-Way Section, as soon as possible (no later than 10 weeks prior to plan completion), for acquisition.

There are times when the contractor will be required to furnish the borrow. There are different procedures for contractor furnished borrow versus DOT furnished borrow. See standard specifications.

Generally the following guide may be used for contractor furnished borrow:

- < 5,000 c.y. – Contractor
- > 10,000 C.Y. – DOT
- 5,000– 10,000 C.Y.– If needed at multiple locations such as a guardrail project the contractor will furnish. If only needed at one location consider DOT furnished.

Try to obtain the borrow close to where it is needed to keep the hauls as short as possible (desirably no more than 1 mile).

There may be times when we will want to make the borrow area a mandatory area. In that event, we will have to make a public interest finding and submit to the FHWA if Federal funds are involved.

Section 106 cultural resource review is needed before the project can be authorized. Coordinate this with Cultural Resources in Design.

There may be special circumstances when Materials and Research would be requested to checkout a borrow area.

III -04.03 Haul (rural grading)

It is the aim to keep the haul distances as short as practicable. Calculate the average haul for all splits and balances. Do this for each dirt mile and also for the total project. See section 203 of Standard Specifications.

Don't show haul for a distance of less than one station.

III-04.04 Waste

There may be times when there is too much material on the project and it must be disposed of. This could be subcut material or just because of the terrain. This material must be disposed of. Sometimes it may be beneficial to use it to flatten the foreslopes beyond what is needed. In some cases the quantity is large enough to have the right of way section go to the project and negotiate for a place to waste the material. If this approach is used, the quantity to be wasted must be forwarded to that section to give them time to negotiate with the land owners. In other cases, where there is not quite so much we could have the contractor find a waste area. It should be noted that it can't be disposed of in wetlands.

If a mandatory waste site is proposed, a public interest finding must be prepared as was the case for mandatory borrow.

III-04.05 Topsoil

The topsoil is to be removed and stockpiled, and then spread over the project when the work is brought to plan grade. There may be times when there is not sufficient topsoil available and in those cases we may have to provide a quantity for extra topsoil. Generally the top 6" is stripped for topsoil, except for where this amount doesn't exist. This should be discussed during the field review.

See Section 203 of the Standard Specifications.

III-04.06 Clearing and Grubbing

This is the first item that has to be accomplished on the project. Generally, this provides for clearing the vegetation, brush, trees, roots and other surface objects from the excavation and embankment areas. Although it somewhat depends on the amount of trees, etc. If there are a large number of, or large diameter (> 8 inches) trees, a pay item should be provided for, "tree removal".

III -04.07 Compaction

The recommendations for the mainline are provided by the Materials and Research Division based on the following guide:

- Generally AASHTO T-99 is used in the Red River Valley and the extreme western edge of the state South of the Missouri River and AASHTO T- 180 in the remainder of the state.
- Type “A” compaction: Density 85% of AASHTO T-180; moisture range from optimum to 5% above optimum.

Density 95% of AASHTO T-99; moisture range from 4% below optimum to 5% above optimum.

Fill deposited in 12 inch layers. Use motor graders, tamping rollers, discs and water to construct embankment.

- Type “B” compaction– same construction effort as Type “A” except that tests are not required. Use moisture as needed.
- Type “C” compaction– Fill deposited in 8 inch layers and compaction achieved by the passage of construction equipment.

The following table lists the item of work and the corresponding compaction;

<u>ITEM</u>	<u>COMPACTION</u>
202– Removal of structures, obstructions, Surfacing, etc.	Under roadway – Type “A” Off roadway – Type “C”
203– Excavation and Embankment	Type “A”
210– Structural Fill	Type “A”- Box culverts and Berms. Abutments - Select Backfill–6 inch layers
230– Subgrade Preparation (asphalt)	Type “A”- Driving Lanes Type “B” – Shoulders
234– Stabilized Base	Type “A”–Top 12 inches
550–PCC Subgrade	Type “A”–For all
602–Concrete Structures	See 210
638–Structural Plate Pipe	Type “A” (consult manufacturer’s Specification)
708– Concrete Slope Protection	Type “C”
710– Temporary Bypass	Type “C”

710– Interstate crossovers and Ramp Connections.	Type “A”
714– Culverts, Drains, etc. (RCP & Metal)	Type “A”– Centerline Type “B”–Approach
722– Manholes, Inlets, etc.	Type “A”–6 inch layers
724– Water and Sewer	Special Backfill to 3 inches above pipe Remainder of fill Type “A”. All other Type “C”
748– Curb and Gutter	6 inch layers.
750– Sidewalks and Driveways	Type “C”
764–Guardrail	Type “C” except if on a full grading project use Type “A”.

III-04.08 Seeding, Sodding and Soil Stabilization

Earthwork, of course, leaves the soil in a bare condition. Therefore, measures must be taken to protect the completed work from the elements of nature. This is generally done by seeding. There are usually some features that dictate the use of sod where growth is needed instantly. These are covered by the standard specifications or special provisions. See section V–04.

For rural grading projects, a temporary cover crop should be provided for at least ½ the disturbed area because of the uncertainty as to when the permanent seeding can be placed. A quantity should be shown based on this premise.

There will be times when it will take more than sod to protect soil because of the potential velocity of the runoff water. In these cases, an erosion control fabric may be needed or it may even require rock riprap. See Section V–04. The hydraulics staffs of Design and Bridge should be consulted.

Note: A storm water permit is required whenever 5 acres are disturbed. The contractor applies to the Department of Health for the permit, but we must make it a contract requirement.

III- 04.09 Engineering Fabrics

These fabrics have become a valuable tool in highway construction. They are not used as a matter of course, but rather to improve some feature such as soil or base stabilization, erosion control, filter, mechanically stabilized embankment, etc. The use of these fabrics should be addressed in the Materials and Research Linear Soil Survey Report.

III-04.10 Widening

When the roadway is not wide enough to place the proposed improvement that meets the respective Design Guide, it may have to be widened. Generally this means widening on both sides, but there may be circumstances where it would be best to shift the centerline and widen on only one side.

III-04.11 Selective Regrading

This would occur if there were some horizontal or vertical curves that needed some correction, or if there was a short segment of roadway needed to be widened or even completely regraded, but the rest of the roadway was satisfactory. This could occur if there were subgrade problems and it was necessary to tear up the existing roadway to correct the problem.

III-04.12 Grade Raises

Generally, this occurs when it becomes evident the roadway is too low and is creating a snow problem or that the roadway is in danger of being flooded.

If the problem is snow then it is desirable to get the roadway up where the wind has an opportunity to blow the roadway clear. Generally, this is most effective when the roadway surface is higher than the adjacent ground.

If the problem is flooding it would be desirable to raise the grade past the outlet elevation for the respective basin.

When considering a grade raise the drainage should be analyzed to determine if the waterway opening is adequate.

III-04.13 Relocations

This occurs when, for whatever reason, it is necessary to completely move a segment of roadway to a new location. This will no doubt result in having to acquire right-of-way, may involve utility relocation, and will involve the environmental, cultural and wetland reviews as well as public involvement.

III-04.14 Replacement of Approach and Centerline Culverts

Generally, the following procedures are followed in replacing culverts on grading and widening projects:

- Approach culverts are replaced on all grading and widening projects.

- Centerline culverts should be considered for replacement on full grading projects if the existing culverts have been in place for 50 years or longer. If replacement is difficult or costly, due to the depth of cover or culvert size, a condition survey should be done. This survey will be used to determine if the culvert can be left in place, or replacement is necessary. A video camera can be used in those culverts that are too small to visually inspect.
- On widening projects, all centerline culverts smaller than 24" diameter should be replaced. A condition survey should be done on all culverts that have been in place for 50 years or longer.
- Concrete culvert sections 48" diameter and larger, end sections, and cattle pass sections should be relaid if they are in good condition and have sufficient strength. Culverts that do not have sufficient strength for the proposed fill height can be used at the ends of the new culvert installation under the foreslope where the fill height is less and within the strength limitations of the old sections.

A determination should be if the cattle pass is being used for drainage and if it should be removed or closed.